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ABSTRACT

A series of exercises and a theory of vowel descriptions can help minimize speakers' problems of excessive tension, awareness of tongue height, and tongue retraction. Eight exercises to provide Forward Facial Stretch neutralize tensions in the face and vocal resonator and their effect on the voice. Three experiments in which sounds are repeated dynamically help to identify primary articulator actions. From observations based upon these experiments, the ideal articulator actions for shaping vowels efficiently can be summarized as lip-rounding, tongue-fronting, and jaw-opening. Emphasizing certain key words help the speaker become aware of the primary articulator actions that shape the oral cavity to create appropriate resonance for each vowel or target phoneme. Frequent vowel shaping actions and emphatic pitch range drills, combined with positive thinking, will improve speech. (JL)

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# "Dynamic Articulation of Vowels"

by

Willie B. Morgan

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# DYNAMIC ARTICULATION OF VOWELS

Willie B. Morgan[1]

Most speakers have relatively little trouble in speaking well in intimate conversational situations. But when greater demands are placed on their speaking ability--to speak, read aloud, or act before a large group of people--we frequently recognize a number of problems that interfere with effective and aesthetic presentations. Their voices often seem somewhat low and throaty, high and shrieky, weak and unfocused, or flat and monotonous, and any dialectal vowel distortions become magnified such as "e-und" for and, "guh-oold" for gold, and "tot" for taught.

Recognizing that tension in the articulators is one of the major causes of such problems, we frequently suggest that the speaker "open his or her mouth more." Although this is an excellent idea in general, it can be perplexing to the person with the problem, especially if the sentence is: "She hit his book with a wooden stick." Or, "Put these two big losers in jail." For opening up in either produces even more gross sound distortions--possibly: "She hat his book with a wawden stick." Or, "Put thayse two big lohsers in jail."

Becoming aware of which vowel sounds can open up is a "must" to allow this suggestion to be useful and less frustrating to speakers.

## TRADITIONAL PHONETIC DESCRIPTIONS OF VOWELS

Many speech improvement programs use articulatory phonetic descriptions of phonemes to help speakers learn to shape their words more effectively. Unfortunately, several problems arise from traditional descriptions of vowel sounds:

Problem 1. Tension is designated as a distinctive feature for many phoneme contrasts such as /i/-/ɪ/ (EE-IH), /e/-/ɛ/ (AY-EH), /o/-/ɔ/ (OH-AW), and /u/-/ʊ/ (OO-oo). When attempting to create this tension, the speaker frequently finds that it affects the muscles in the back of the tongue, pharyngeal wall, and sometimes the velum and larynx. Consequently, the tone may sound forced, raucous, throaty, and unnaturally pitched, especially when /i/ (EE) or /u/ (OO) vowels are emphasized.

Problem 2. Tongue height for vowels is differentiated by low, mid, and high. However, most individuals find it difficult to become aware of such gradations kinesthetically[2] and probably rely on acoustic feedback more than muscle sensations for vowel perceptions. Kinesthetic awareness of tongue height seems to be limited to two gradations, and those two may be perceived primarily through an awareness of the relative amount of jaw opening that is occurring simultaneously.

Problem 3. The negative effects on pharyngeal resonance caused by retracting or raising the tongue excessively are widely recognized.[3] However, the vowel descriptions of traditional articulatory phonetics may increase tongue retraction. For instance, the concept of "back" vowels--the deliberate retracting and raising of the back of the tongue, plus the designated tension for /u/ (OO) and /o/ (OH)--specifically works against the need to open up the vocal resonator for producing strongly stressed vowels with a balanced or full-tube resonation of tone.[4]

The problems of excessive tension, awareness of tongue height, and tongue retraction are minimized with the approach used in the following exercises and the theory of vowel descriptions suggested.

WARMUP EXERCISES

The purposes of these warmup exercises are to relax and lengthen habitually tensed muscles and to help speakers recognize the most efficient articulator actions or movements for shaping the vowel phonemes. Many constricted jaw, velar, pharyngeal, and back tongue muscles are associated with tensions in muscles of the face.

Experiment. Produce an /ɑ/ (AH) vowel with each of the following facial tensions: an intense grimace, an intense sneer, and an intense smile. Repeat this experiment, and become aware of the tight feelings in the throat and jaw muscles and the unpleasant qualities of the sounds. The effects noted for each of these tensions are most likely to be a low pitched, throaty, guttural sound; a nasal and muffled or twangy sound; and a high pitched, velar ("heady"), strident sound.

One or more of these three muscle groups are habitually tensed by a majority of speakers. The stronger the emphasis on the stressed vowel(s) of words, the greater

the habitual tensions applied to the face and throat.

To neutralize tensions in the face and vocal resonator and their effect on the voice, we can cultivate Forward Facial Stretch (FFS).[5]

Exercise 1. Locate each set of facial muscles (sneer, smile, grimace); shake and massage them gently, stroking them forward toward pouted lips.

Exercise 2. To keep your lips relaxed, blow air between them in a "sputter."

Exercise 3. Gently massage the muscles around your jaw hinges.

Exercise 4. Yawn fully--allow your jaw to open fully and all your face and lip muscles to stretch forward gradually. At first your jaw may close; encourage it not to by placing your index fingers firmly against your hollow cheeks--between the back teeth and just in front of the jaw hinges.

Exercise 5. Audibly "sigh" on the open yawn and note you will be saying how. Repeat how slowly several times with good breath support.

In exercises 5-8, when you find you are beginning with a tone that is somewhat low and throaty or high and thin, hum an "m . . ." and let the pitch jump up or down a little to find an appropriate note on which to begin the sound sequences.[6]

All muscle actions of the tongue, face, lips, and jaw should be thought of as stretching forward or open to shape the vowel sounds, then as relaxing to neutral--but never as retracting, pulling back, or tensing.

Exercise 6. Repeat each of the following sound sequences five times while encouraging your face and lip muscles to stay forward throughout. Use a mirror to check. Sputter between each sequence to relax lip tensions. Begin slowly, but the exercise can be done more rapidly after you become aware of the appropriate feelings to associate with these forward muscle actions.

a. woo . . . wee . . . woo . . . (FFS, 5x, sputter)

b. Woe . . . Way . . . Woe . . . (FFS, 5x, sputter)

c. WOW . . . "Y" . . . WOW . . . (FFS, 5x, sputter)

Note that your jaw and lips will open up more for the "Woe" and "WOW" sequences and the pitch will rise a little if you maintain good breath support. Feel your tongue

roll forward for the "wee," "Way," and "Y" words, with the tip behind your lower teeth.

Exercise 7. Feel full smooth muscle movements as you repeat each of the following word pairs. Good FFS will cause your jaw to relax open a little more for the first word in each pair. Be aware of the sound energy "buzzing" in the front of your mouth.[7]

a. you--we b. Yo'--Way c. "YOW--Y"

d. NOW--WINE e. No--Wayne f. do--wean

In each pair, note the simultaneous, contrasting tongue and lip actions. First, feel your tongue relaxing as your lips round forward--then, feel your lips relaxing as your tongue rolls forward. Repeat this sequence several times; breathe as frequently as you need to maintain good breath support. The pitch will rise slightly during the a-b-c sequence and lower slightly during the d-e-f sequence.

Exercise 8. Repeat each sentence often at various rates--then sputter. Use a variety of appropriate pitch levels and maintain good FFS throughout!

a. We will win two wonderful awards. b. Warren and Wendy waited one moment for Willie.

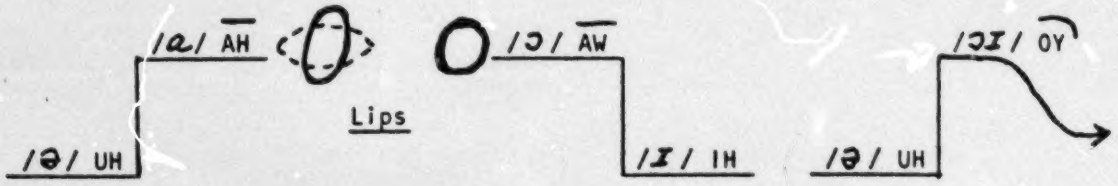
c. Those eight wives were wedded as they warbled, "Weep no more, my lady . . . ."

## IDENTIFYING PRIMARY ARTICULATOR ACTIONS

Experiment 1. Repeat the following words several times. Then extract their vowels (drop their consonants), and repeat the vowels dynamically while noting movements of the tongue, lips, and jaw. Use good FFS throughout.

hum--hah! haw--him ahoy

You should have isolated the vowels below. Those that are diagramed higher, you will note, require a relatively greater opening of the jaw and lips to shape them efficiently. Also, the more open vowel shapes are, the higher the fundamental pitch which can resonate through them efficiently and pleasantly.



Observations. The muscles of the lips and the tongue are neutral during the /ə/ and /ɑ/ phonemes. The difference between them is a neutrally open jaw for /ə/ (about one index finger's space between the front teeth) and a jaw stretching fully open for /ɑ/ (at least two finger's space between the front teeth).

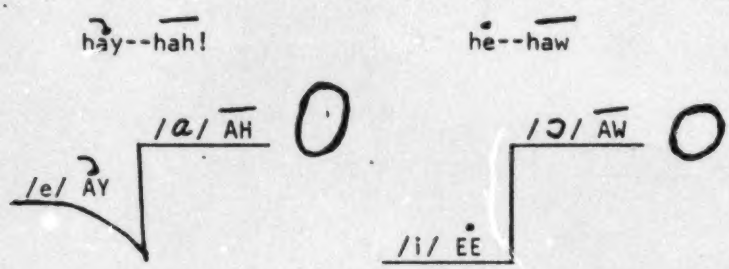
The oval shape of the lips for /ə/ and /ɑ/ lies on its side (horizontally) for less dynamic speaking. However, good FFS and a slightly greater jaw opening for dynamic emphasis will cause the oval shape of /ɑ/ to stand on its end (vertically). Alternate /ə/-/ɑ/ several times and check the lip shapes with a mirror; avoid feeling any muscle tensions in the lips or tongue.

The lips round for the /ɔ/ vowel. But the jaw is fully open and the tongue neutral--the same as they are for /ɑ/. Alternate /ɑ/-/ɔ/ several times; check oval and rounded lip shapes with a mirror; avoid feeling any movement of the jaw or tongue.

Finally, alternate the /ɔ/-/ɪ/ several times. Note that the rounded lips neutralize, the neutral tongue fronts, and the fully open jaw relaxes to neutral--all occur simultaneously to change the cavity shape. When these two sounds are blended smoothly into one syllable, the /ɔɪ/ (OY) diphthong is formed as in ahoy, coin, etc.

The fully open jaw position can be indicated by placing a line above vowel spellings. A curved line indicates a movement of the jaw from the fully open position to neutral during the vowel--forming a diphthong and creating a natural downward pitch inflection.

Experiment 2. Repeat these word contrasts dynamically, then just the vowels as you note the articulator actions which create them. Maintain good FFS.

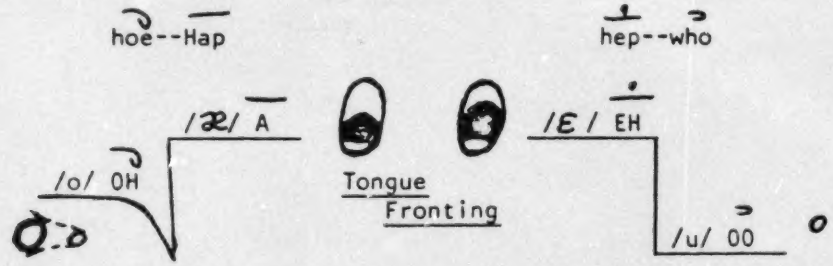



Observations. /i/ and /e/ are produced with a fully fronted tongue, represented by a dot above vowel spellings. The lips are neutral for both. (No smiles!)

The jaw is open neutrally for /i/. /e/ is a diphthong during which the jaw moves from the fully open position to neutral. Note that the symbols for jaw movement ( ⁀ ) and fully fronted tongue ( • ) are written together ( ⁀• ).

Review observations above for /ɑ/ and /ɔ/.

Experiment 3. Repeat these word contrasts dynamically, then just the vowels as you note the articulator actions which create them. Maintain good FFS.




Observations. /u/ and /o/ are produced with fully rounded lips, represented by a hook above the vowel spellings. The tongue is neutral for both.

The jaw is open neutrally for /u/. /o/ is a diphthong during which the jaw moves from the fully open position to neutral. Observe that the lip opening decreases in size as the jaw closes. Note that the symbols for jaw movement ( ⁀ ) and fully rounded lips ( ◡ ) are written together ( ◡⁀ ). Check all actions with a mirror.

The tongue is fronted (rolled forward) for /æ/ and fronted fully for /ɛ/. The lips are neutral and the jaw opens fully for both. (No smiles!)

A NEW VOWEL PHONEME DESCRIPTION SYSTEM

From the above observations, we can summarize the ideal articulator actions for shaping vowels efficiently as lip-rounding, tongue-fronting, and jaw-opening. Two degrees of movement can be discerned for each:

Lips: Neutral (N), Rounding (R), Rounding Fully (RF).

Tongue: Neutral (N), Fronting (F), Fronting Fully (FF).

Jaw: Opening Neutrally (ON)--1+ finger between the front teeth--
Opening Fully (OF)--2+ fingers between the front teeth.
(Muscle tension is required to close the jaw from its neutral position to articulate many consonants such as /s/, /z/, /f/, and /v/.)

The ideal emphatic shaping of the vowel phonemes of English are described in this chart by using the abbreviations above. (→ = diphthong movements)

| | Vowel Phonemes | Articulator Actions: Tongue | Lips | Jaw | Key Words & Action Symbols | | | | Vowel Respellings |
|---|---|---|---|---|---|---|---|---|---|
| Neutral | /ə/ | N | N | ON | hud | abutt | mom/mum | mullah | UH |
| | /ɑ/ | N | N | OF | hod | bard | ma | Allah | AH |
| Rounding | /ʊ/ | N | R | ON | hood | Butch | put | bull | oo |
| | /ɔ/ | N | R | OF | haw | bought | Morley | ball | AW |
| | /u/ | N | RF | ON | who | boot | mousse | brew | OO |
| | /o/[8] | N | RF | OF | hotel | bore | motif | board | OH |
| | /o/[9] | N | RF | OF→ON | hoe | boat | motive | bold | OH |
| | /ɑʊ/[10] | N | N→R | OF→ON | how | about | mouth | Braun | OW |
| | /ju/[11] | FF→N | N→RF | ON | hew | you | music | beautiful | YOO |
| Fronting | /ɪ/ | F | N | ON | him | bit | Millie | beer/bier | IH |
| | /æ/ | F | N | OF | Hap | bat | man | backer | A |
| | /i/ | FF | N | ON | he | beat | meek | Bede | EE |
| | /ɛ/ | FF | N | OF | hep | bet | Mecca | bare/bear | EH |
| | /e/[12] | FF | N | OF→ON | hay | bait | mane | obey | AY |
| | /ɑɪ/[10] | N→F | N | OF→ON | high | bite | mine | by | EYE |
| | /ɔɪ/ | N→F | R→N | OF→ON | ahoy | Boyd | moist | boil | OY |
| R-vowel | /ɚ/[13] | HF(?) | HR | ON | her | bird | murmer | Myrtle | UR |

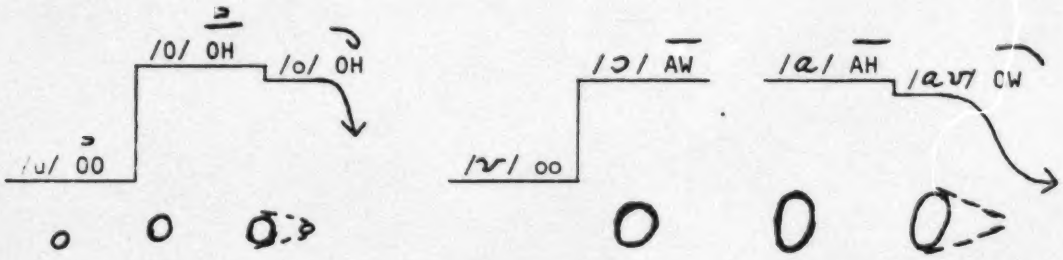
Emphasizing these key words can help us become aware of the primary articulator actions which shape the oral cavity to create appropriate resonance for each vowel or target phoneme.[14] Also, a conscientious relaxation of articulators noted as neutral can help us avoid excessive, unneeded tensions in the vocal tract which contribute to strident and/or nasal voice resonance and a throaty focus.

Remember that all articulator movements are relative--the more emphasis placed on a particular vowel/syllable/word, the greater the shaping actions needed, especially the amount of jaw opening (and good FFS).

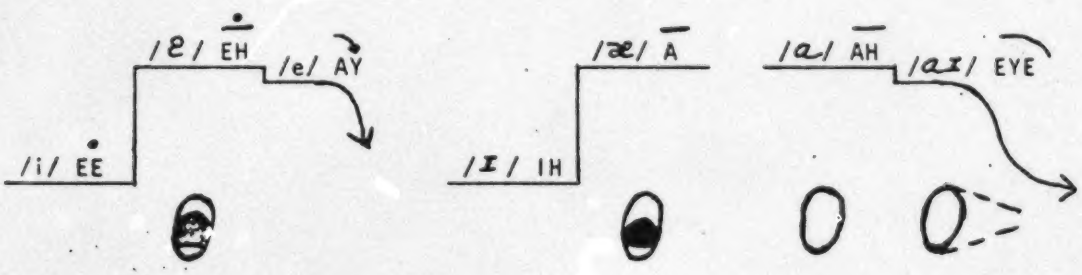
VOWEL SHAPING ACTIONS AND EMPHATIC PITCH RANGE DRILLS

As you speak each vowel sequence below--feel the jaw-lip-tongue movements and exaggerate them slightly on dynamic repetitions. Note several important lip and tongue pictographs beneath the drills. Let the pitch steps and inflections widen as you repeat the drills, but avoid thin tones or throaty focus by using good FFS and good breath support at all times.

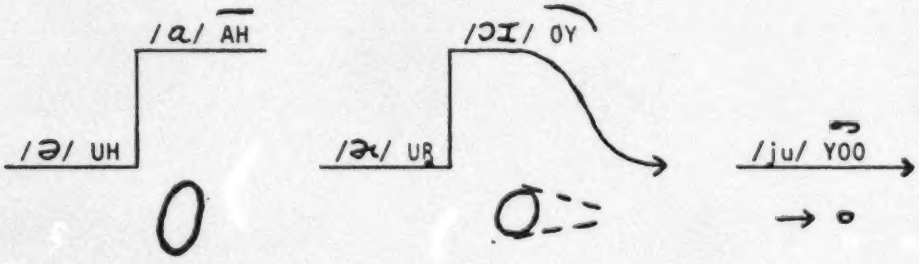
Drill 1: Lip-Rounding Action with FFS




Drill 2: Tongue-Fronting Action with FFS




Drill 3: Mixed Articulator Actions with FFS




Repeat these drills frequently using a variety of consonants: /h- p- m- t- g-/ in initial positions; /-t -b -n -ŋ -k/ in final positions; and /h--t/, /p--n/, /m--k/, /t--ŋ/ surrounding the vowels. "Play" with the sound repetitions--have fun! Some

units of sound will be "words" in English; many are potential syllables in our speech.

Vowel shaping actions, like all exercises, become easier to accomplish with conscientious practice--the same as playing piano scales, pitching a curve ball or a spin, catching a football pass, or drawing aesthetically pleasing pictures. We must think positively. We are maximizing our potential efficiency and minimizing negative energy intrusions rather than trying to change our dialect or "the way we speak."

Most weak or "unstressed" vowels in English are either /ə/, /ɪ/, or /ɤ/. They require the least amount of articulator movement. The jaw is in its neutrally open position for each of them; the tongue may be fronted or the lips rounded--but neither fully. General American speech also uses a less energetic r-vowel /ɚ/, but this is frequently pronounced as /ə/ in Southern, New England, and British speech.

APPLICATION PROJECTS

We now know which vowels can be spoken dynamically by "opening our mouths more" (‿). Also, we realize when fully rounded lips (ᵓ) or a fully fronted tongue (˚) is an appropriate action to maximize oral resonance. Our efficient use of these articulator movements and FFS in drills needs to be transferred to sentence practice.

Careful shaping of the stressed vowels in our most important words (often only two to four per sentence[15]) is sufficient to maintain an open throat and a strong, fully resonant voice with good pitch variety. Gradually, efficient actions will become habitual as you practice and present speeches, oral readings, and acting roles.

Speak the following sentences slowly with efficient articulation stretch on every vowel which could potentially be stressed. Then repeat each sentence several times emphasizing only two or three words. Vary these emphatic or "operant" stresses to convey different interpretations each time you read. Look for unusual variety--do not be concerned about the "correct" meaning. Don't rush! Our goal is to become so familiar with the ideal shaping actions for each vowel that we automatically "reach" for them each time we emphasize a word--without marking scripts. Marking is used only as a convenience in guided practice materials and for clarifying problems.

Project 1: Lip-Rounding Action with FFS

The foolish troll shouted loudly: "Who rolled that bowling-ball over my golden shoe?"

This short, cruel warrior put in a call for a good lawyer. Then he scolded his naughty

cook's beautiful daughter: "Oh, you ruined two more of my sore toes! Owl Ow! OW!!"

Project 2: Tongue-Fronting Action with FFS

The beastly man shamed his wife for maiming a flying creature that scared her. She said:

"Hey, man, that evil vampire was Dracula's pet. He came last night and bit my neck!"

SUMMARY

We have examined three difficulties in using traditional phonetic descriptions of vowels to improve common problems in energetic speaking. Several warmup exercises and articulation experiments helped us to cultivate Forward Facial Stretch and to recognize the primary movements of the tongue, lips, and jaw. These actions formed the basis of a new system for describing the dynamic articulation of vowels.

Application of these descriptive movements to vowel drills and practice sentences suggests how such "heightened" experiences can be applied to new materials. Maximizing efficient articulator actions can be particularly useful when preparing for public presentations. Ultimately, the feeling of ideal vowel shapes will become . . . spontaneous!

FOOTNOTES

[1]Willie B. Morgan, M.A., University of Virginia (1953), is an Associate Professor of Speech and Dramatic Arts at Eastern Michigan University. The concepts for this article have been selected from research and new theories in The Sound and Shape of Dynamic Speech, a text in progress.

[2]Concerning the difficulty of knowing where the tongue is or what it is doing, with references to research in this area, see Daniel R. Boone, The Voice and Voice Therapy, 2nd ed. (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1977), p. 40.

[3]Boone, pp. 38-41, 98, and 108-11; and Hilda B. Fisher, Improving Voice and Articulation, 2nd ed. (New York: Houghton, Mifflin Co., 1975), ch. 3.

[4]For an excellent treatment of the state of the science, see Sadanand Singh and Kala S. Singh, Phonetics: Principles and Practices (Baltimore: University Park Press, 1976), pp. 53-58 and 83-168. Film strips and articulation diagrams in this text are particularly innovative and useful. However, traditional phonetic descriptions tend to emphasize what most people usually do, rather than ideal formations of sounds for energetic speaking. For practical descriptions and approaches to producing more efficient vowel sounds, see Arthur Lessac, The Use and Training of the Human Voice: A Practical Approach to Speech and Voice Dynamics, 2nd ed. (New York: DBS Publications, Inc./Drama Book Specialists, 1967), pp. 61-70; and J. Clifford Turner, Voice and Speech in the Theatre, 3rd ed., rev. by Malcolm Morrison (London: Pittman Publishing, Ltd., 1977), ch. 3.

[5]This concept is treated more fully in Lessac, pp. 15-20 and 56-59.

[6]Morton Cooper, Modern Techniques of Vocal Rehabilitation (Springfield, Illinois: Charles C. Thomas, Publisher, 1973), pp. 74-76. Also, see Boone, pp. 91-93 and 131-33; and Willie B. Morgan, "How to Use Pitch Variety Effectively in Oral Communication," Michigan Speech Association Journal 13 (1978), pp. 4-14.

[7]This "buzzing" sensation allows us to realize that sound wave reflections in the resonating tube (pharynx and mouth) are focused forward efficiently without excessive tensions in the throat area. The focus concept is treated in Cooper, pp. 21, 41, and 71-83; and in Lessac, pp. 79-85 and 112-14.

[8]To avoid confusion, the large O-symbol is used to represent the monophthong phoneme and the small o-symbol is used to represent the diphthong phoneme. The /O/ is not an IPA symbol; but this use parallels the use of /ɛ/ and /e/. See nn. 9 and 12.

[9]The diphthong phoneme symbol /o/ represents [Ou] when full rounding is maintained in the lips, to be encouraged during dynamic speaking. During casual speaking, the rounding may be relaxed somewhat (RF→R), resulting in [Oʊ].

[10]The diphthong phonemes /aʊ/ and /aɪ/ are frequently transcribed as /aʊ/ and /aɪ/, but [a] is not phonemically distinctive from /ɑ/. See n. 14. During emphasis, the second elements of these diphthongs are occasionally more fully articulated (RF or FF), creating [aʊ] or [aɪ].

[11]The semi-vowel consonant /j/ (Y) is really a quick /i/ (EE) vowel. Therefore, /ju/ is categorized as a diphthong by convention although it may be considered a consonant plus-vowel unit similar to /wi/ (WEE), for the semi-vowel consonant /w/ is really a quick /u/ (OO) vowel too.

[12]The diphthong phoneme symbol /e/ represents [ɛi] when full fronting is maintained in the tongue, to be encouraged during dynamic speaking. During casual speaking, the fronting may be relaxed somewhat (FF→F), resulting in [ɛɪ].

[13]H in the r-vowel description means "half" or partial articulator action. During the American /ɚ/, the front-center of the tongue is humped up toward the hard palate, or the tip of the tongue may be retroflexed (curled up toward the alveolar ridge) like the /r/ consonant. Many speakers use both articulations. In either, the side edges of the tongue should be firmly felt inside the upper side teeth. A slight lip rounding and good FFS help insure an open, relaxed throat. The vowel is often considered to be a syllabic consonant /ɻ/. This reflects reality; for the sounds represented by the "older spelled vowels" have been "lost," and the "r" sound resonance has become the nucleus of the syllable. The /ɚ/ can be indicated in copy by placing a dot below the r-vowel spelling. (Non-syllabic /ɚ/ is considered to be /-r/.)

[14]Common dialectal variations of vowel phonemes (allophones) are created often by only "half" (H) or partial articulator actions.. The nature of these speech improvement exercises causes them to be modified toward the target phonemes as articulator actions are maximized. Several allophones found in the major dialects of English are:

| | Tongue | Lips | Jaw | Key Words and Dialectal Areas |
|---|---|---|---|---|
| [o̞] | N | HR | ON | home (New England--Kenyon's symbol) |
| [ɒ] | N | HR | OF | hot (New England and British) |
| [ɪ̈] | HF | N | ON | sister, children (Southern) |
| [a] | HF | N | OF | I, why (Southern) |
| [ɜ] | HF | HR | ON | her, bird (less tongue humping than /ɚ/; New England, Southern, British) |

Frequently, the [a] is considered to be the first element of the /aʊ/ and /aɪ/ diphthongs.

[15]Although linguistic stresses occur on one-third to one-half of all syllables in English, only a few of these receive dynamic emphasis in oral delivery. Usually, only one emphasized syllable/word per spoken phrase--occasionally two.